AMENDMENTS TO THE CLAIMS

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1. (Currently Amended) A method of forming a dual-sided semiconductor device from a wafer, the wafer having a ~~top~~ first surface, ~~a bottom~~ an opposing second surface, and a dopant concentration, the method comprising the steps of:

forming a layer of masking material on the ~~top~~ first surface of the wafer;

patterning the layer of masking material to ~~form a first opening in the layer of masking material that exposes~~ expose a first region on the ~~top~~ first surface; and

forming ~~a first~~ an opening in the wafer and a doped region in the wafer ~~between the first opening in the wafer and the bottom side after the layer of masking material has been patterned~~, the opening forming exposed regions of the wafer, the doped region having a ~~top~~ surface exposed by the ~~first~~ opening in the wafer, and a dopant concentration that is greater than the dopant concentration of the wafer~~;~~

~~forming a layer of conductive material to fill up the first opening in the wafer; and~~

~~planarizing the layer of conductive material to form a first conductive region directly over the doped region~~.

2. (Currently Amended) The method of claim ~~1 wherein~~ 21 and further comprising the steps of:

~~the~~ forming a layer of masking material ~~is also formed~~ on the ~~bottom~~ second surface of the wafer~~, the layer of masking material is patterned to form a second opening in the layer of masking material that exposes~~ to expose a second region on the ~~bottom~~ second surface of the wafer, the first and second ~~openings~~ regions being substantially vertically aligned,

~~a second~~ forming an opening ~~is formed~~ in the ~~bottom side~~ second surface of the wafer~~;~~ to expose the doped region in the wafer ~~being between the first and second openings in the wafer after the layer of masking material has been patterned~~, the doped region having a ~~bottom~~ surface exposed by the ~~second~~ opening in the second surface of the wafer; and

~~the~~ forming a layer of conductive material ~~is formed~~ to ~~also~~ fill up the ~~second~~ opening in the second surface of the wafer~~;~~ and

~~the layer of conductive material is also planarized to~~ form a second conductive region ~~directly below~~ that contacts the doped region.

3. (Currently Amended) The method of claim ~~2~~ 21 wherein the step of forming ~~a first~~ an opening in the wafer and a doped region in the wafer includes the steps of:

forming a layer of masking material on the second surface of the wafer to expose a second region on the second surface of the wafer, the first and second regions being substantially vertically aligned;

introducing a dopant into the wafer through the first and second ~~openings in the layer of masking material~~ regions, the dopant extending continuously through the wafer from the first region to the second region, and forming a continuous region through the wafer that has a dopant concentration greater than a dopant concentration of the wafer; and

etching the first and second regions for a predetermined period of time after the dopant has been introduced to define ~~the~~ a first opening in the ~~top~~ first surface of the wafer, ~~the~~ a second opening in the ~~bottom~~ second surface of the wafer, and the doped region there between.

4. (Currently Amended) The method of claim ~~2~~ 21 wherein the step of forming ~~a first~~ an opening in the wafer and a doped region in the wafer includes the steps of:

forming a layer of masking material on the second surface of the wafer to expose a second region on the second surface of the wafer, the first and second regions being substantially vertically aligned;

introducing a dopant into the wafer through the first and second ~~openings in the layer of masking material~~ regions, the dopant extending continuously through the wafer from the first region to the second region;

removing the layer of masking material after the dopant has been introduced;

forming a protective layer on the ~~top~~ first surface and the ~~bottom~~ second surface of the wafer after the layer of masking material has been removed;

patterning the protective layer to ~~form a first opening in the protective layer that exposes~~ expose the first region of the ~~top~~ first surface, and ~~a second opening in the protective layer that exposes~~ the second region of the ~~bottom~~ second surface~~,~~ ~~the first and second openings in the protective layer being substantially aligned~~; and

etching the first and second regions for a predetermined period of time after the protective layer has been patterned to define ~~the~~ a first opening in the ~~top side~~ first surface of the wafer, ~~the~~ a second opening in the ~~bottom side~~ second surface of the wafer, and the doped region there between.

5. (Currently Amended) The method of claim ~~2~~ 21 wherein the step of forming ~~a first~~ an opening in the wafer and a doped region in the wafer includes the steps of:

forming a layer of masking material on the second surface of the wafer to expose a second region on the second surface of the wafer, the first and second regions being substantially vertically aligned;

etching the first and second regions for a predetermined period of time to define ~~the~~ a first opening in the ~~top~~ first surface of the wafer, ~~the~~ a second opening in the ~~bottom~~ second surface of the wafer, and a remaining region there between; and

introducing a dopant into the wafer through the first and second openings ~~in the layer of masking material~~, the dopant extending continuously through the remaining region to form the doped region.

6. (Currently Amended) The method of claim ~~2~~ 21 wherein the step of forming ~~a first~~ an opening in the wafer and a doped region in the wafer includes the steps of:

forming a layer of masking material on the second surface of the wafer to expose a second region on the second surface of the wafer, the first and second regions being substantially vertically aligned;

etching the first and second regions for a predetermined period of time to define ~~the~~ a first opening in the ~~top~~ first surface of the wafer, ~~the~~ a second opening in the ~~bottom~~ second surface of the wafer, and a remaining region there between;

removing the layer of masking material after the etch has been completed;

forming a protective layer on the ~~top~~ first surface and the ~~bottom~~ second surface of the wafer after the layer of masking material has been removed;

patterning the protective layer to ~~form a first opening in the protective layer that exposes~~ expose a top surface of the remaining region, and ~~a second opening in the protective layer that exposes~~ a bottom surface of the remaining region~~, the first and second openings in the protective layer being substantially aligned~~; and

introducing a dopant into the wafer through the first and second openings ~~in the protective layer~~, the dopant extending continuously through the remaining region.

7. (Currently Amended) The method of claim ~~2~~ 21 and further comprising the step of forming a ~~first~~ diffusion barrier on the doped region and exposed regions of the wafer~~, wherein the layer of conductive material is formed on the first diffusion barrier to fill up the first and second openings in the wafer~~.

8. (Cancel).

9. (Original) The method of claim 2 and further comprising the step of forming a first device that contacts the first conductive region, and a second device that contacts the second conductive region.

10. (Currently Amended) The method of claim ~~1~~ 21 wherein the doped region has a surface substantially planar with the ~~bottom~~ second surface of the wafer.

11. (Currently Amended) The method of claim 10 wherein the step of forming ~~a first~~ an opening in the wafer and a doped region in the wafer includes the steps of:

introducing a dopant into the wafer through the first ~~opening in the layer of masking material~~ region, the dopant extending continuously through the wafer from the ~~top~~ first surface of the wafer to the ~~bottom~~ second surface of the wafer; and

etching the first region for a predetermined period of time after the dopant has been introduced to define the ~~first~~ opening in the ~~top surface of the~~ wafer, and the doped region between the ~~first~~ opening and the ~~bottom~~ second surface of the wafer.

12. (Currently Amended) The method of claim 10 wherein the step of forming ~~a first~~ an opening in the wafer and a doped region in the wafer includes the steps of:

etching the first region for a predetermined period of time to define the ~~first~~ opening in the ~~top side of the~~ wafer, and a remaining region between the ~~first~~ opening and the ~~bottom~~ second surface; and

introducing a dopant into the wafer ~~through the first opening in the layer of masking material~~, the dopant extending continuously through the remaining region to form the doped region.

13. (Original) The method of claim 10 and further comprising the step of forming a first device that contacts the first conductive region, and a second device that contacts the doped region.

14. (Original) The method of claim 10 and further comprising the step of forming a contact through the doped region to make an electrical connection with the first conductive region.

15. (Original) The method of claim 14 and further comprising the step of forming a first device that contacts the first conductive region, and a second device that contacts the contact.

Claims 16-20. (Cancel).

21. (New) The method of claim 1 and further comprising the step of forming a layer of conductive material to fill up the opening in the wafer and form a first conductive region that contacts the doped region.